Do individuals with children value the future more?

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ABSTRACT

In recent years public and political debate suggested that individuals with children value the future more. We attempt to substantiate the debate, and we use a representative survey to investigate if the number of children (or simply having children) is indeed associated with a higher valuation of the future, which we proxy with an aspect of time preferences, patience. We find that, in general, there is no correlation between having children and patience, though for young women with below-median income there is some weak evidence in line with the conjecture. We also show some evidence that it is not having children that matters, but marital status. More precisely, single women are less patient than other, non-single women.

1. INTRODUCTION

In May 2013, Niall Ferguson remarked that Keynes claimed that "In the long run, we are all dead" because he was childless, and hence did not care about the long run. He added that the long term was only of interest to those who had children. He later apologized for his harsh words, stating that people who do not have children also care about the future (The Guardian 2013). However, some

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commentators supported Ferguson's view that having children is related to how one views the future (Bowyer 2013).

In 2016, after the Brexit referendum, David Cameron resigned, and the Conservative party was looking for a new prime minister. One of the candidates was Andrea Leadsom, who said that being a mother makes her a better candidate for prime minister than Theresa May, because it means that she has "a very real stake" in the future of Britain. She claimed (Coates 2016) that contrary to Theresa May "I have children who are going to have children who will directly be a part of what happens next." In a similar vein, during the campaign in the 2017 French election, Jean-Marie Le Pen told of Emmanuel Macron that "He talks to us about the future, but he doesn't have children!" (Collins 2017). Many other articles dealt with the fact that leaders (or ex-leaders) of many other important countries are also childless (e.g., the German Chancellor Angela Merkel, Dutch Prime Minister Mark Rutte, Swedish Prime Minister Stefan Löfvren, Luxembourg Prime Minister Xavier Bettel, Scottish First Minister Nicola Sturgeon, and European Commission President Jean-Claude Juncker), and hence do not have a long-term view (McPherson 2017).

Based on the previous examples, many individuals seem to believe that having children is associated with how individuals value the future. However, research on this conjectured association is almost non-existing. In order to contribute to the debate, we use representative survey data from Hungary and attempt to see if the conjecture holds. We proxy the valuation of the future with an aspect of time preferences, *patience*. Our proxy is not perfect as it measures time preference on a shorter horizon than the long-term view brought up in our motivating examples, but we lack any measurement of long-term time preferences. The survey contains extensive demographic data, including many items related to family. Patience was introduced in the survey questions using multiple price lists. The main question in this paper is whether the number of children is related to how the respondent values the future. First, we investigate through simple correlations if there is some relationship between patience and the number of children. Then we carry out a regression analysis to control for a host of factors that may be hidden by simple correlations. We also carry out the same analysis using a dummy for having children instead of the number of children as a robustness check.

We report three findings. First, in general, patience is not associated with the number of children without and also with additional controls. Second, in line with Bauer and Chytilová (2013), we document that in the case of young women with a low income the relationship holds at least weakly. Third, our investigation reveals that marital status, more precisely being single or not, correlates with patience for women (but not for men). Once we control for marital status, children cease to be associated with patience. When we focus on having children, we find qualitatively the same results. Our results are correlational, as our data does not allow for establishing causal relationships.

The rest of the paper is structured as follows. Section 2 reviews the literature. Section 3 presents the data, while section 4 contains the statistical analysis with the results. Section 5 concludes.

2. LITERATURE REVIEW

Patience has been shown to be an important *deep* determinant of economic development (e.g., Olsson – Hibbs Jr 2005; Spolaore – Wacziarg 2009; Algan – Cahuc 2010; Ashraf – Galor 2013; Alsan 2015; Dohmen et al. 2018); a higher level of patience is associated with higher

income both on the individual and the country level. Therefore, a growing literature seeks to understand the factors that affect time preferences. For instance, Weber (2002) underlines the importance of Protestantism, Chen (2013) shows the effect of language, while Galor and Özak (2016) indicate the relevance of agricultural origins in understanding time preferences. Our study represents a contribution to this literature by investigating if being a parent may be a factor related to patience.

The literature on this issue is scarce. Concerning climate change that is somewhat related to how much individuals care about the future, Sundblad et al. (2007) show that parenthood is not associated with worries and risk judgment about future climate change. However, Kreibich (2011) finds that individuals with young children are more likely to undertake precautionary measures against climate change. The paper closest to ours is Bauer and Chytilová (2013), who investigate the factors affecting patience and future-oriented choices using an Indian sample. They measured risk and time preferences experimentally and relate these variables to socio-economic and demographic characteristics. The main focus of their paper is gender differences and their causes, but they also show that women with young children are significantly more patient than their counterparts without an offspring. They also document that women's patience increases with the number of children, up to a point. However, there is no clear relationship between patience and children in the case of men. Moreover, there is no significant difference in patience between men and women with no children. Interestingly, it is not the number of children *per se* that matters, but the number of young children, more precisely sons up to 18 years. Furthermore, the links identified between patience and children are significant only in the case of poor (below median wealth) families. Our study complements Bauer and Chytilová (2013) in several aspects. On the one hand, we have a representative sample of the population of a whole country instead of a sample of 426 married individuals from Southwestern India. On the other hand, our sample is from a (high-income) developed country, so this study is a test if findings from a developing country hold also in more developed countries. A short-coming of our paper compared to Bauer and Chytilová (2013) however is that they incentivize their measurement of time preferences, while we could not implement an incentivized measurement.[1]

3. DATA

A quarterly, representative survey of the Hungarian population with a randomized sample of about 1,000 adult individuals is carried out by the TÁRKI Social Research Institute.[2] It is based on personal interviews. A substantial part of the survey is asked in each quarter, comprising data on gender, age, family status and structure, level of education, labour market status, individual and family incomes, wealth, and financial situation. Importantly, this information allows us to see if the respondent has children and the number of children.

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[1]However, Branas-Garza et al. (2020) show that the lack or the presence of incentivization does not lead to different results when measuring time preferences.

[2]TÁRKI follows strict data protection and security protocols that are in line with the General Data Protection Regulation (GDPR) of the European Union and with national regulation (concretely, the Act CXII of 2011 on the Right of Informational Self-Determination and Freedom of Information).

Scholars can introduce questions to the survey at a cost, so we asked TÁRKI to introduce three items into the first survey in 2017. Following Falk et al. (2018), we used the staircase (or unfolding brackets) method (for details see, for instance, Cornsweet 1962) to measure time preferences with five questions, because it is an efficient way to approximate the indifference point between a present and a future payoff. We utilized interdependent hypothetical binary choices between 10,000 Forints (about 32.2 EUR or 34.4 USD at that time) today, or X Forints in a month. We did not change the 10,000 Forints during the five questions, but we changed the amount X systematically depending on the previous choices. For example, if an individual chooses 10,000 Forints today instead of $X = 15,500$ Forints in a month, then it shows that she has an indifference point that is larger than 15,500 Forints, hence in the next question we increased X. With five questions, there are $2^5 = 32$ possible last choices that we use as a proxy for the indifference point, as we explain later. In Horn and Kiss (2020), we show that patience measured in the survey associates with life outcomes as expected and in line with the literature.

The future is unavoidably uncertain, so risk attitudes may be confounded with time preferences. When an individual makes decisions about the future, then their choice is not only influenced by the fact that the consequence of the choice materializes at a future point in time, but also by the inherent uncertainty. Without controlling for risk preferences, we may underestimate the coefficient of time preferences, hence we needed to measure risk preferences. To do so, we followed Sutter et al. (2013) and used a simple question that asked how much of 10,000 Forints the respondent would risk in the following gamble. Hypothetically, we draw a ball randomly from a bag that contains 10 black and 10 red balls. The individual has to guess the colour (black or red) of the ball, and if she is correct, then she receives double the amount that she risked. Otherwise, the bet is lost. We also made clear that the individual would receive the amount not risked in the gamble hypothetically. The amount risked in the gamble is a proxy of risk attitude.[3]

The third item we introduced in the survey was almost identical to the first one, the only difference being the time horizon. In this case, the earlier date was in a year, while the later one in a year and a month. According to the (β, δ)-model (see for instance Laibson 1997) the now vs. 1 month task not only measures patience (δ), but also time inconsistency (β), so following the literature we use the third question to measure patience.[4] Respondents encountered the preference tasks in the same order as described here.

We calculate our measure of patience in the following way. Based on the last answer of the respondent to the previous "money earlier or later" questions on the longer horizon, we can infer the indifference point of the respondent. For instance, if the respondent in the last choice prefers the earlier 10,000 Forints to the later 16,500 Forints, then we know that their indifference point is between 16,500 Forints and the next largest amount. For simplicity, we take the lower bound, so we assign the indifference point 16,500 Forint to this respondent. Then, their patience (or individual discount factor denoted by δ in the (β, δ)-model) is computed as

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[3]Our proxy is reminiscent of the investment game in Gneezy and Potters (1997). Crosetto and Filippin (2016) investigate four risk elicitation methods and show that the investment game is a meaningful way to distinguish individuals according to their risk attitudes.

[4]The time preference measures on the two horizons are highly correlated (pairwise correlation of 0.67, P-value<0.001). The main finding of the paper – that the number of children and time preferences do not relate – does not change qualitatively if we use the data related to the first question.

10,000/16,500, or in more general terms $\delta = money\ earlier/money\ later$, which is always less than 1 by construction.

Some remarks are in order about the suitability of our patience measure. Note that the higher δ is, the less an individual requires for having to wait, which is equivalent to being more patient. Our δ approximately measures how much an individual values things that will happen in a year (as the choice to calculate it involves 12 versus 13 months). If we assume that the individual uses the same δ to discount any future utilities, then their discounted utility has the form $U = \sum_{t=1}^{\infty} \delta^t u_t$, where u_t represents the future utility that the individual will enjoy in year t. Since $\delta < 1$, the lower δ, the more the individual discounts the future. The motivation of the paper assumes that the future utilities are related to the well-being of the children and since parents care about their children, they probably have a higher δ. Hence, we may have the conjecture that having children is associated with higher δ. Note that several assumptions are involved in the previous conjecture. First, the short-term δ that we measure is not necessarily the same as the long-term δ implied by our conjecture. While the (β, δ)-model recognizes that the immediate discount factor may be different from the more distant one, we do not have a firm knowledge on how those more distant discount factors are related. If the δ-s related to more distant outcomes are different from the δ-s corresponding to outcomes in the near future, then our analysis may be misleading. Second, our patience measure is based on monetary choices that may not capture broader concerns about the future. Since there is no better measurement of time preferences that we are aware of, we believe that it makes sense to investigate the association between patience and having children with our measure.

The survey has a wide range of socio-demographic data, including the number of children (see Table 1). We group the rest of the variables as follows. The exogenous variables include age, age squared, a female dummy, and if the interviewer believes that the respondent is of Roma origin.[5] The region variables contain dummies for the regions of Hungary and the type of settlement the respondent lives in.[6] The family variables include dummies related to the marital status (single, married, separated, living with a partner, widow, divorced). The education variables contain dummies indicating if the respondent has a higher than primary education and if the respondent has a tertiary education degree. The income variables provide information on the income level,[7] on the wealth level,[8] and on financial difficulties.[9] The last group of variables

[5]It is prohibited by law to ask the respondent's ethnicity.

[6]We have six dummies for the regions of Hungary, the baseline region being Central Hungary. To control for settlement type, we use three dummy variables (town, city, Budapest), the baseline being village.

[7]In the survey, respondents could either report an estimated average monthly amount of their net income or state the level of their net income on a 1–8 scale. We have imputed the 8-category income variable with the continuous income variable, and included an additional dummy for the missing cases.

[8]To assess wealth, we constructed the principal factor of six dummy variables showing if the respondent has 1) a car, 2) a dishwasher, 3) a washing machine, 4) a landline phone, and 5) whether the respondent owns the property they live in, and whether 6) they own another real estate property. We replaced missing values (for 34 respondents of 998) on this principal factor with zero (the average value) and included a missing dummy to control for this in the regressions below.

[9]We have information on whether the individual has problems of 1) paying public utility bills, 2) servicing a mortgage, or 3) other types of loans. Principal factor analysis allows us to create an index that proxies the extent of financial difficulties from these three dummy variables.

Table 1. Descriptive statistics

	Mean	SD	Min	Max
Patience (δ)	0.81	0.16	0.47	1
How many children does R have?	1.30	1.13	0	6
Age	49.67	15.04	18	93
Female	0.58	0.49	0	1
R is labeled as of Roma origin	0.05	0.22	0	1
Single	0.19	0.39	0	1
Married	0.39	0.49	0	1
Separated	0.02	0.13	0	1
Living w/partner	0.09	0.28	0	1
Widow	0.14	0.34	0	1
Divorced	0.18	0.38	0	1
Marital status missing	0.01	0.07	0	1
Low education level	0.48	0.50	0	1
Median education level	0.37	0.48	0	1
High education level	0.15	0.36	0	1
Income <20.000 HUF	0.00	0.06	0	1
21.000 HUF < income <40.000 HUF	0.03	0.17	0	1
41.000 HUF < income <70.000 HUF	0.07	0.25	0	1
71.000 HUF < income <100.000 HUF	0.15	0.36	0	1
101.000 HUF < income <150.000 HUF	0.26	0.44	0	1
151.000 HUF < income <200.000 HUF	0.14	0.35	0	1
201.000 HUF < income <300.000 HUF	0.06	0.24	0	1
301.000 HUF < income <500.000 HUF	0.01	0.09	0	1
Income, missing	0.28	0.45	0	1
Wealth index	0.00	0.70	−1.45	1.97
Wealth, missing	0.03	0.18	0	1
Financial difficulties, index	0.00	0.74	−0.24	4.47
Public servant	0.08	0.27	0	1
Works for public company	0.20	0.40	0	1
Other	0.70	0.46	0	1
Public servant, missing	0.03	0.16	0	1

(continued)

Table 1. Continued

	Mean	SD	Min	Max
Employed	0.57	0.50	0	1
Employee	0.05	0.22	0	1
Unemployed	0.05	0.22	0	1
Retired	0.27	0.44	0	1
Inactive	0.03	0.18	0	1
Student	0.02	0.14	0	1
Other	0.01	0.08	0	1
Observations	998			

Source: authors.

refers to work and contains information on whether the respondent works in the private or the public sector and their employment status (e.g., unemployed, employee, employed, inactive, etc.). We consider these variables in the regression analysis below as they may be related to patience and having children. For instance, education level may be associated with patience and having children. If highly educated individuals tend to be more patient and also have more children, then an association between patience and having children may just be a product of those correlations. In the previous example, education is a confounder, but note that it can also be a mediator if we assume that more patient individuals obtain a higher education level that makes them have more children. We are unaware of causal maps that provide a basis on how to think about the potential relationships between our controls and the variables of interest (patience and children), so we consider our regression analysis a correlational investigation with controls.

4. RESULTS

As a first step, we look at non-linear bivariate associations captured by fractional-polinomial plots allowing an illustrative representation of the correlations. Figure 1 shows the association between the number of children and patience in the total population and three subpopulations. In choosing these subpopulations, we follow Bauer and Chytilová (2013) who show that women, and especially poor women, with young children are more patient. In Fig. 1, we see a flat relationship between patience and the number of children in the total population, and when we consider women only, the overall relationship is somewhat negative, suggesting that women with children tend to be slightly more impatient, which is not in line our expectations. When we study women under 40 (who have probably younger children than the average women), then the association begins to exhibit some curvature Women with one or two kids seem to be a bit more patient than women without children; albeit this relationship is very weak. When investigating women under 40 and below the median income, we observe the pattern described in Bauer and
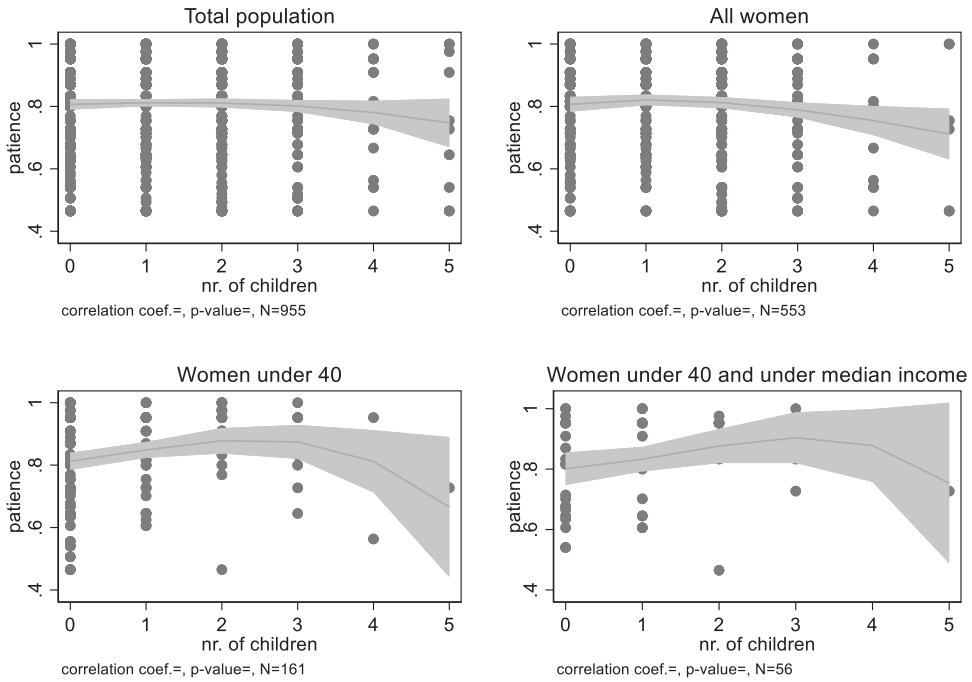
Fig. 1. Fractional-polinomial curves showing the bivariate association between the number of children and patience
Source: authors.

Chytilová (2013), however, the number of cases here are small ($N = 56$), and we lack proper statistical power. Pairwise linear correlations reveal that the association between the number of children and patience fails to be significant in any of these instances.[10]

To better understand the potential relationship between patience and the number of children, we proceed with a regression analysis. We use coefficient plots to present our results as these provide a clear illustration of the association of the number of children and patience, with controls included. The coefficient plots visualize the coefficients at the 5% significance levels using thick/thin lines. We present various specifications. In the first specification, we include only the number of children as an explanatory variable.[11] From the second specification, in a consecutive manner, we add the set of variables that we presented in Table 1. Hence, in specification 2 we add the *exogenous* controls, then we introduce *region, family, education, income,* and *work* controls in this order. In the final specification we also control for risk. By controlling for risk we might "over-control", as risk and time preferences are intertwined, but it

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[10]We have very similar findings for men. Plots are available from the authors upon request.

[11]While the power of our analysis is decreasing substantially by cutting the sample, we believe we gain more in these sub-sample regressions, as compared to the full-sample interactive models, as the controls in the subsamples might have different effects on the dependent variables.
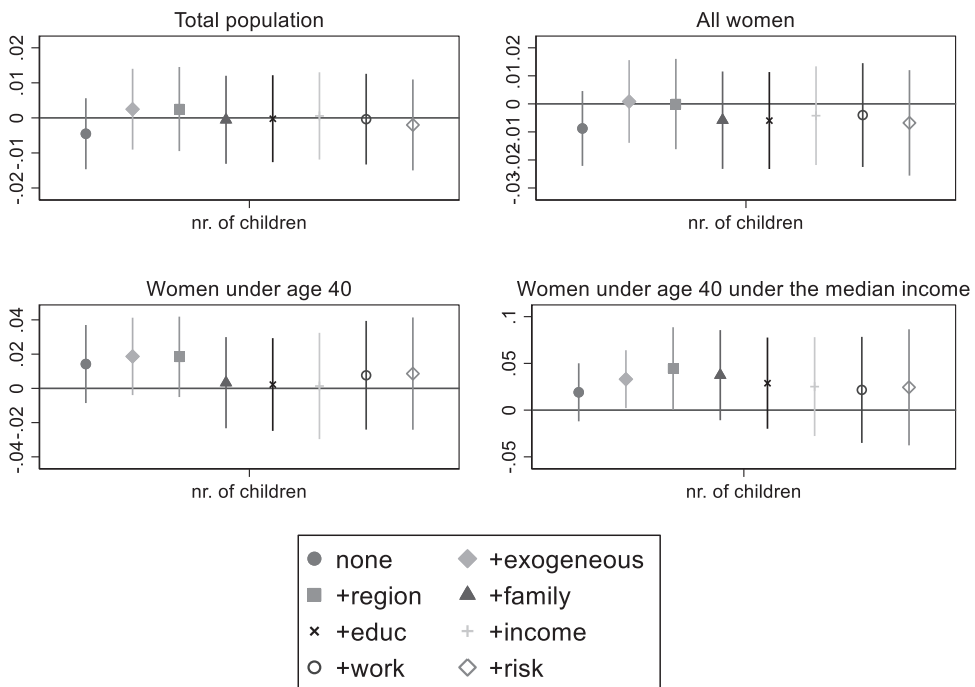
Fig. 2. The association of patience and the number of children in different subpopulations. Coefficient plots
Source: authors.

is interesting to see whether the association of the number of children and patience are mediated by risk preferences or not.

Figure 2 indicates that when considering the total population, in none of the specifications do we observe any significant correlation between the number of children and patience.[12] The same holds when studying only women. However, when considering women under 40, we find that the number of children has a marginally significant and positive association with patience in one of the specifications, namely when *exogenous* and *region variables* are included, but when we add more controls, the association becomes insignificant. The largest change in this association occurs, when we control for marital status (*family*), suggesting that marital status plays a key role. When considering women under 40 and below the median income we find a marginally significant positive association in the same specification as in the previous case, but adding more controls makes the association insignificant, though the relationship remains clearly positive. Note that we have only 53 observations for women under 40 and below-median income, so this finding should be taken with a pinch of salt, as our power here is clearly not high.

Note, however, that even when the point estimates are (marginally) significant, they are very close to zero. The highest association (coefficient) we estimate – within the low income young

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[12]The regressions underlying the coefficient plots are available upon request from the authors.
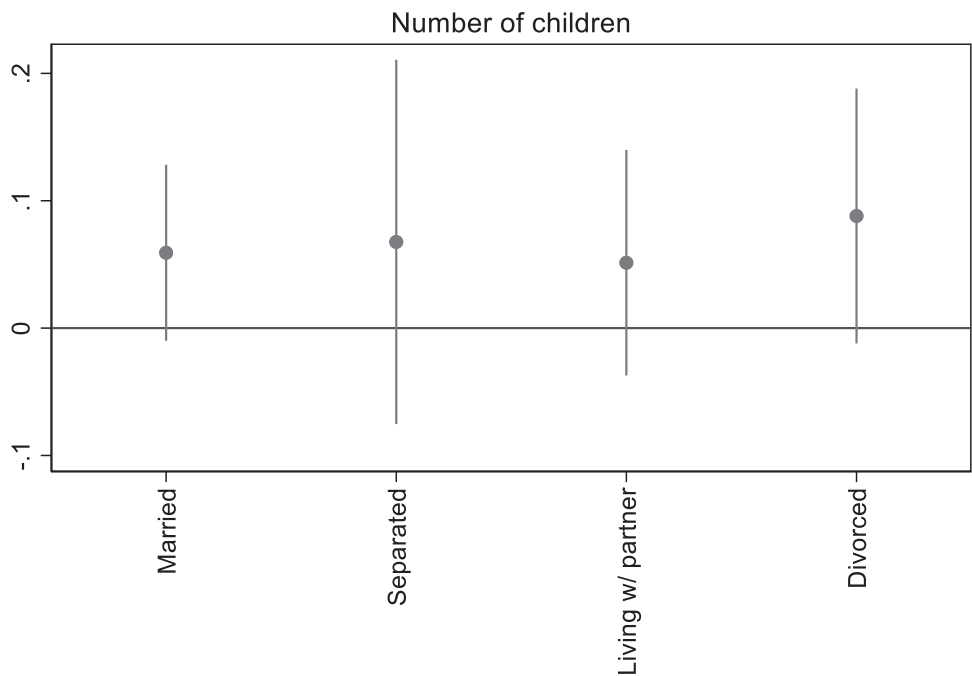
Fig. 3. The association of patience and marital status in the case of women under 40. Coefficient plots.
(Reference category: single)
Source: authors.

women, and including only exogenous and regional controls – is 0.045 (which drops to 0.024 when additional controls are included). Considering that the average value of patience (δ) in our sample is around 0.8 with a 0.16 standard deviation, this is a relatively small effect size. We carry out the same analysis for men, but in none of the specifications do we observe any significant association between the number of children and patience. Overall, we do not find convincing evidence that the number of children correlates significantly or substantially with patience.

The previous analysis suggests that marital status may be an important factor in understanding patience. That is, the only specification, when the association is either marginally significant, or positive and sizeable is among young women (and especially among low-income young women). Looking closely at these specifications, it turns out that the difference between single and non-single young women are much larger than the point estimates of the number of children (see Table 3 in the appendix for the regression outputs). In Fig. 3 we show that compared to single women under 40, other women under 40 (that is, married, separated, partnered or divorced) exhibit a higher level of patience. The difference is marginally significant for married and divorced women at the 10% level.[13] If we compare single and non-single women under 40, then there is a significant difference in patience between these two groups, even after

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[13]Regressions corresponding to Fig. 3 are available upon request from the authors.

Table 2. The association of patience and marital status for women under 40

Variables	(1) Patience
Single	−0.0753**
	(0.0324)
Nr. of children	0.000753
	(0.0134)
Nr. children * Single	0.0507**
	(0.0256)
Constant	1.011***
	(0.338)
Observations	149
R-squared	0.447

Notes: all other controls included. Robust standard errors in parentheses. *** $P < 0.01$, ** $P < 0.05$, * $P < 0.1$.
Source: authors.

controlling for the exogenous variables, regional dummies, education, income, variables related to work and risk. Naturally, having a partner correlates very well with having children: almost 90% of single women under 40 are childless, while 70% of non-single women have at least one child. Since Bauer and Chytilová (2013) only investigated married individuals, they could not discover the role of marital status.

Can we better disentangle the association between being single and the number of children? If we include both the number of children and the *single* status in the full regressions and their interactions, Table 2 shows that it is the fact of being single that drives the association and not the number of children. It seems that either patience and the number of children are uncorrelated, or that the correlation for young women is due only to partnership status: single women under 40 tend to be more impatient. To put it more bluntly: if anything, it is the partner and not the children that makes one more patient!

Note that being single makes a difference in terms of patience only for women under 40.[14] To put in some context, the difference in patience between single and non-single women under 40, is about 14% of the range between the minimum and maximum patience levels that we observe in our data. Moreover, it is more than twice as big as the difference in patience between individuals with at most elementary schooling and individuals with university education.

Until now, we have focused on the number of children, but maybe it is having children that matters and not their number. When the independent variable is having at least one child and we consider the total population or the population under 40, we obtain the same results as before: having child(ren) is not significantly correlated with patience. If we restrict our attention

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[14]When we consider different subpopulations of single and non-single individuals, statistical tests reveal significant differences only for women under 40. Regressions are available upon request from the authors.

to women, we see somewhat larger coefficients, but associations still fail to be significant. Going one-step further and only considering women under 40, having at least one child correlates significantly with patience when only risk, exogenous variables and regional dummies are considered, but ceases to be significant once we add marital status. We see the same results when limiting our attention to women under 40 and below-median income. If we investigate the association of marital status with patience for women under 40, then – similarly to the previous findings – relative to being single women of other marital statuses are more patient and in some cases the differences are marginally significant. We also observe that when being single is included in the regression, the coefficient of having at least a child becomes insignificant. Overall, considering the number of children or having at least one child yields the same findings.[15]

5. CONCLUSION

The public and political debates presented in the Introduction strongly suggest that many people believe that individuals with children value the future more as they have a larger stake in the future. The only study that directly investigates this hypothesis is Bauer and Chytilová (2013). They provide some supporting evidence using an Indian, non-representative sample, claiming that women with young children (and especially the poor ones) are more patient. To shed more light on this issue, we measured patience in a non-incentivized but representative survey of the Hungarian population to see if our measure of patience associates with the number of children (or having children in general) at all.

   Our main result is that parenthood and patience do not correlate. In general, people with children are not more patient than people without children. Hence, politicians with or without children are not expected to care about the future differently. However, on a small subsample of low-income women under the age of 40 we find some positive association between patience and children. Once we add sufficient controls, the association disappears. Note however, that the power of our analysis in these subsamples is low. Moreover, it seems that it is the fact of being single that plays a crucial role and not the number of children. Single young women (who are more often childless) are more impatient, than their partnered counterparts, and this drives our results. Hence, our data do not support the claim that individuals with children value the future more in general, and we show that having (or having had) a partner seems to correlate with patience for young women. An explanation for our result may be that concerns about the future are not only related to having children, but may be motivated by broader perspectives as the future of the human race.

   Our paper has limitations. A potential issue with our approach is that our measure of patience (based on binary monetary choices) does not capture an enhanced valuation of the future that parents may exhibit. Indeed, there is some evidence of domain specificity related to patience. For instance, Chapman and Elstein (1995) and Chapman (1996) find that individuals have different discount rates for monetary decisions and health-related decisions.[16] Clearly,

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[15]The regression tables showing the details of the robustness check are available upon request.

[16]Weatherly et al. (2010) also report unlike discount rates for different domains. However, no significant differences are found by Hardisty and Weber (2009) regarding the discounting of monetary and environmental outcomes, a finding that has been reproduced by Ioannou and Sadeh (2016).

more research is needed to see if our findings hold for different measures of patience. Moreover, albeit this is a representative sample of the Hungarian population, but once we look at sub-samples – as low-income young women – the sample becomes small, and hence our estimations lack power. A further limitation of our study is that valuing the future may not only be related to having children, but also to the plan of having children. Our data are silent on this issue, so we cannot test if concern for the future is already different for those who plan to have children.

ACKNOWLEDGMENT

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APPENDIX

Patience and being single

Table 3. The level of patience for singles and non-singles in different subpopulations. For the tests
P-values are reported

	Overall	Women	Men	Women under 40	Women over 40	Men under 40	Men over 40
Single	0.798	0.795	0.801	0.793	0.802	0.798	0.797
Non-single	0.810	0.811	0.808	0.870	0.798	0.790	0.811
Difference (non-single - single)	0.012	0.015	0.007	0.077	−0.005	−0.008	0.014
Wilcoxon ranksum test	0.284	0.237	0.758	0.003	0.837	0.772	0.825
Kolmogorov-Smirnov test	0.154	0.116	0.996	0.012	0.842	0.995	0.922
Epps-Singleton test	0.417	0.407	0.907	0.005	0.782	0.469	0.523

Source: authors.